Environment Canada | Environnement Canada

JUN 2 1 2016

Marlene H. Dortch, FCC Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: FCC Public Notice - COMMENT SOUGHT TO UPDATE THE RECORD ON LIGADO'S REQUEST THAT THE COMMISSION INITIATE A RULEMAKING TO ALLOCATE THE 1675-1680 MHZ BAND FOR TERRESTRIAL MOBILE USE SHARED WITH FEDERAL USE (RM-11681), dated April 22, 2016

Dear Ms. Dortch,

Please accept this letter as a response to the subject Notice on behalf of several departments of the Canadian federal government. These departments are users of the NOAA GOES Data Collection Platform (DCP) and/or GOES imagery and we wish to express our concern surrounding a process towards the potential sharing of 1675-1680 MHz band with Ligado or any other terrestrial mobile provider.

The key stakeholder departments of the Government of Canada on this matter include Environment and Climate Change Canada (ECCC), Natural Resources Canada (NRCan), the Canadian Armed Forces (CF) and Department of National Defence (DND), Agriculture and Agri-Food Canada (AAFC) and Fisheries and Oceans Canada (DFO). All of these departments are providers of critical government services related to public safety and security, environmental protection, and safe and efficient commerce. Each has operational dependencies on the GOES DCP and/or GOES imagery, and disruption to these systems would have negative impacts on the reliable delivery and quality of these public services. Further, at the federal level, there are other departments that have indirect dependencies including Transport Canada (TC), Canadian Space Agency (CSA), Polar Knowledge Canada (PKC) and Shared Services Canada (SSC). The relevant activities of several departments are summarized in the Appendix to this letter.

In addition to these federal departments, in Canada there are also provincial and territorial governments and a host of universities, media companies, and private enterprises with similar dependencies. However, these other users are generally unaware of FCC regulatory proceedings and the potential impacts of this Notice, and the short response time will limit the number of comments from these stakeholders.

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The GOES DCP is a principal telecommunications tool for several national *in situ* environmental monitoring networks, including weather stations, hydrometric monitoring sites, marine data buoys, and geomagnetic observatory stations - many in remote locations without redundant means of communication. Data from most Canadian observing sites are currently accessed through Data Collection Platform Reports (DCPR) via the US NWS gateway at the NOAA Satellite Operations Facility (NSOF) in Suitland, MD, and through the Emergency Data Distribution Network (EDDN) of the U.S. Geological Survey (USGS) in Sioux Falls, SD. This access is critically dependent on uninterrupted reception at the primary receiving sites in the US and data redistribution via NOAA and USGS servers. Any disruption at the Direct Readout Ground System (DRGS) sites in the US will result in degradation of the data distributed to users (including the Canadian government and counterpart US agencies) through the Internet, dedicated land lines, or Low-Rate Information Transmission (LRIT) channels.

As in the US, in Canada GOES imagery is the principal tool for synoptic-scale detection and tracking of weather systems including severe weather events. The imagery is acquired through direct readout antennas located across Canada and used by forecasters for the generation of weather forecasts and warnings, and by others to support forest fire detection and weather-sensitive operations. The stakeholder departments are concerned about the potential for direct interference from mobile systems operating in the 1670-1680 MHz band deployed in proximity of the US-Canada border. These may compromise the operation of our current and future GOES stations centered around 1686 MHz. Several of these stations are located close to the US-Canada border and face south with low elevation angles. Fixed earth receiving stations are currently located at Dartmouth (Nova Scotia), Montreal (Quebec), Dorval (3)(Quebec), Ottawa (Ontario), Downsview (Ontario), Trenton (2)(Ontario), Stony Plain (Alberta), Vancouver (2)(British Columbia), and Victoria (British Columbia). For the future GOES-R (2016) and GOES-S (2017) missions centered at 1686.6 MHz, 2-4 fixed earth receiving stations are planned at locations still to be determined.

The departments have not conducted their own analyses of the Lightsquared/Ligado studies submitted to the FCC under RM-11681 but are familiar with field tests concluding that sharing of the 1675-1680 MHz band is not feasible unless very large exclusion zones are enforced, thus making the band unattractive to terrestrial mobile service providers (e.g. 'DCS & LRIT, LTE In-Band Interference Study', Microcom Design, Inc., April 2016). Therefore the departments are not confident that disruptive interference can be avoided if the 1675-1680 MHz band is shared between the US Federal Government and new terrestrial mobile operations. In the absence of scientific consensus, the stakeholder departments recommend that FCC apply the precautionary principle and not move forward with sharing with Ligado or any other terrestrial mobile provider.

The departments of the Canadian federal government who are users of the GOES DCP and GOES imagery wish that the US Administration does not modify the current US table of allocations to allocate or share the 1675-1680 MHz band with Ligado or any other terrestrial mobile provider.

Yours sincerely,

David Grimes
Assistant Deputy Minister
Meteorological Service of Canada

CC:

The Honorable Lawrence E. Strickling, Assistant Secretary for Communications and Information and NTIA Administrator, Department of Commerce
The Honorable Dr. Kathryn D. Sullivan, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

Appendix

This Appendix describes the dependencies of several departments of the Government of Canada related to the 1675-1680 MHz band.

Environment and Climate Change Canada (ECCC)

The Meteorological Service of Canada (MSC) of the department of Environment and Climate Change Canada (ECCC) is the counterpart of the NOAA National Weather Service. The MSC is the primary supplier of meteorological and water resources information in Canada. The core business of the MSC is to provide weather and hydrometric information, forecasts and warnings 24-hours a day, 7days a week, to help protect the safety and security of Canadians and their property.

Among the MSC's national observing networks are approximately 1600 atmospheric and hydrometric observing stations from across Canada which rely on the GOES Data Collection Platform (DCP) for data transmission.

Hydrometric observations are used for flood warning, response and monitoring, emergency and routine reservoir operations and monitoring of navigable water levels. GOES DCPs are the primary means of communication within many US/Canada transboundary watersheds. Near real-time acquisition and transmission of water level data during flood events is critical for deployment of emergency personnel and reservoir operations.

The surface and marine network observations are used directly by forecasters and assimilated into Canadian and US numerical weather prediction models to improve local, regional, and global forecasting. The marine network, which includes Great Lakes and Ocean buoys, provides essential information for international marine navigation and international users in Canadian waters. In addition, partner organizations to the MSC including all provinces and some hydroelectric utilities depend on the MSC networks, operate networks of their own, and have independent receiver sites that would be affected by interference either directly or indirectly.

Natural Resources Canada

Natural Resources Canada uses the GOES system to transmit 1-minute geomagnetic observations from 15 observatories across Canada to two receiving stations in Ottawa, ON and Victoria, BC. This data is critical for real-time monitoring of the earth's magnetic field for applications such as navigation, directional drilling and geophysical surveying, as well as for providing alerts for space weather events with potential for impacts to critical infrastructure such as electricity power distribution systems, pipelines, satellite operations, radio

communication and GNSS operations. Interference to either the uplink or downlink systems, some of which are sited close to the US/Canada border, presents a vulnerability to mission delivery which has potential public safety implications.

Canadian Armed Forces and Department of National Defence

The Canadian Forces Weather and Oceanographic Service (CFWOS) includes military Meteorological Technicians and embedded meteorologists from MSC who all rely heavily on GOES imagery and meteorological observations from ECCC for 24/7 forecasting and weather briefing support to the Royal Canadian Navy, the Canadian Army and the Royal Canadian Air Force. These forces operate in data sparse areas of Canada on missions such as vessel tracking at sea, search and rescue and support to civil authorities, and the weather support provided to them by the CFWOS is critical to their safety and effectiveness. Any interruption of GOES satellite data could be detrimental to the quality of the services provided by the CFWOS.

Fisheries and Oceans Canada

Fisheries and Oceans Canada (DFO) has the lead federal role in managing Canada's fisheries and safeguarding its waters through the provision of maritime infrastructure, information, products, and services necessary to ensure safe navigation and the protection of life and property. To ensure safe navigation in Canadian waterways, the Department provides official nautical products and services meeting domestic and international standards. Additionally, the Department provides the modelling of ocean conditions, including tides and currents, allowing for forecasts that aid navigational decision-making and the protection of the coastal zone from natural hazards. Hydrographic and oceanographic information are also used in non-navigational applications relating to marine services and development such as shoreline engineering, search and rescue, and off-shore energy source development.

GOES satellite images/data give strong support to the DFO operational and scientific activities for marine monitoring and forecasting. The secured communication with these buoys and satellites is vital to support the DFO mandates. The sharing of the 1675-1680 MHz band could lead to interference to these communications, and affect the quality of DFO's ability to meet its mandates, such as management of fisheries and safeguarding in coastal waters.

Agriculture and AgriFood Canada

Agriculture and Agri-Food Canada (AAFC) is the Canadian federal Government Department responsible for agriculture. Its mission is to provide leadership in the growth and development of a competitive, innovative and sustainable Canadian agriculture and agri-food sector.

The ongoing monitoring and reporting of the state and change of Canada`s agricultural systems is necessary for AAFC to deliver on its mandate. Core data required by the department include, but are not limited to, climatological and hydrological information acquired from Environment and Climate Change Canada (ECCC), whose networks may be affected negatively by the proposed changes to the 1675-1680 Mhz radio frequency band. Continued, reliable and timely access to these data is of critical value to AAFC, and any disruption to these services would have a negative effect on AAFC`s monitoring programs and ability to proactively manage climate-related risks to the sector.

Furthermore, accurate and timely weather forecasting is critical to the success of agriculture sector. The timely access to data from the ECCC weather/climate monitoring network is used by forecasters in both the public and private sectors. Continued, reliable and timely access to these data is of critical to the sustainability of the agriculture sector and to Canada's global competitiveness.